

New and Rare Liparidid Species from the Okhotsk and Bering Seas and Their Adjacent Waters

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Abstract Five species of liparidid fishes, *Careproctus cyclocephalus* sp. nov., *C. macrodiscus*, *C. furcellus*, *Paraliparis grandis* and *P. rosaceus*, are described or redescribed from specimens collected from the Okhotsk and Bering seas and their adjacent waters. *C. cyclocephalus*, described from the Okhotsk Sea off Hokkaido, is distinguished by its simple recurved canine teeth; gill opening widely separated from the pectoral fin; uppermost pectoral fin ray situated below the posterior corner of the maxillary; 26~31 pectoral fin rays and 33~50 pyloric caeca; pale peritoneum and black stomach. Second records of *C. macrodiscus* and *P. grandis* are reported. The four species redescribed here are the first records from Japan.

North Pacific liparidids are one of the largest groups of fishes with over 100 nominal species. However, they are poorly known because of the rarity of specimens and the difficulty of studying such soft-bodied fishes. During a taxonomic study of this group, five interesting species of the genera *Careproctus* and *Paraliparis* were found in recent liparidid collections preserved at the Laboratory of Marine Zoology, Hokkaido University. These specimens were collected by an otter trawl from 1974 to 1981. Thirty-two specimens taken from the southern Okhotsk

Sea are described as a new species of *Careproctus*. The other four are identified as *Careproctus macrodiscus* Schmidt, *C. furcellus* Gilbert et Burke, *Paraliparis grandis* Schmidt, and *P. rosaceus* Gilbert. Both *C. macrodiscus* and *P. grandis* were each known from a single specimen taken from the northern Okhotsk Sea and lacked detailed collection information. *C. furcellus* has been recorded from the Aleutian Islands and the northern and central Okhotsk Sea. *P. rosaceus* was known only from the Pacific coast of North America. These four species are described with additional morphological information and distributional records, which document the first known occurrences for Japan.

Methods and materials

Counts, measurements, and terminology follow Stein (1978) with the following exceptions: rays of the lower pectoral fin lobe counted from the anteriormost ray to the longest ray; rays of both pectoral fins counted. Terminology and locations of cephalic pores are shown in Fig. 1. Cephalic pore formula lists the number of pores in each series in the following order: nasal, maxillary, mandibular, and suprabranchial series. Vertical fin rays and vertebrae are counted from radiographs. Pectoral fin rays in most specimens are counted by dissecting their bases.

Specimens used in this study are deposited in the Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University (HUMZ), and in the National Science Museum (National

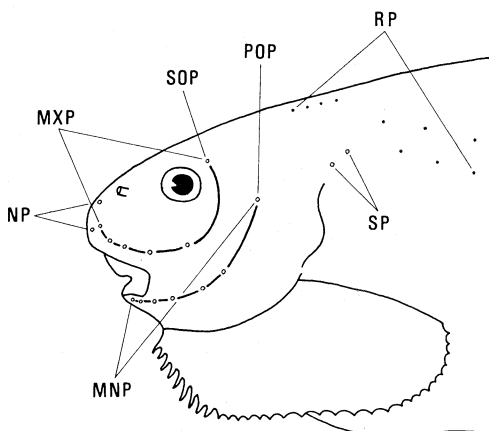


Fig. 1. Diagram showing the arrangement of cephalic and rudimentary pore series on a typical liparidid fish. NP, nasal pore; MXP, maxillary pore; SOP, supraocular pore; MNP, mandibular pore; POP, postocular pore; SP, suprabranchial pore; RP, rudimentary pore.

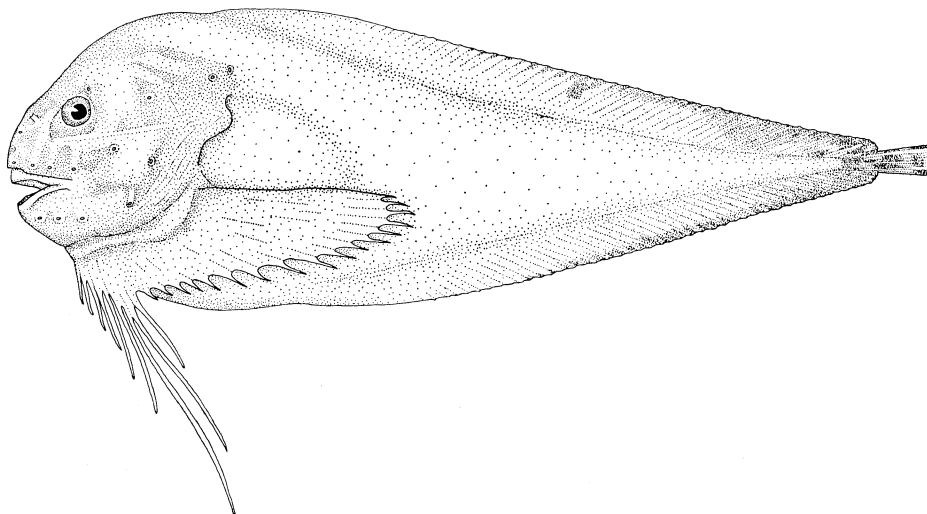


Fig. 2. *Careproctus cyclocephalus*, holotype, HUMZ 77754, 282 mm SL, from off Abashiri, Okhotsk coast of Hokkaido.

History Institute), Tokyo (NSMT-P).

***Careproctus cyclocephalus* sp. nov.**

(New Japanese name:

Daruma-konnyaku-uo)

(Fig. 2)

Holotype. HUMZ 77754, female, 282 mm standard length (SL), 44°27'N, 144°26.5'E, off Abashiri, Okhotsk coast of Hokkaido, depth 930~950 m, 25 Sep. 1978.

Paratypes. 31 specimens, collected from off Abashiri: HUMZ 70923, male, 231 mm SL, 44°12'N, 144°54'E, depth 750 m, 23 Oct. 1977; HUMZ 71077, male, 283 mm SL, 45°02'N, 144°23'E, 700 m, 29 Oct. 1977; HUMZ 75926, female, 264 mm SL, 44°57.2'N, 144°24.0'E, 400~450 m, 28 Jun. 1978; HUMZ 77586, 77590~77592, 4 females, 204~288 mm SL, 44°49'N, 144°28'E, depth unknown, 20 Sep. 1978; HUMZ 77609, female, 285 mm SL, 44°46'N, 144°28'E, 700~790 m, 21 Sep. 1978; HUMZ 77644, male, 253 mm SL, 44°48'N, 144°26'E, 680~800 m, 21 Sep. 1978; HUMZ 77687, male, 264 mm SL, 44°37'N, 144°20'E, depth unknown, 23 Sep. 1978; HUMZ 77805, male, 44°15'N, 144°36'E, depth unknown, 8 Oct. 1978; HUMZ 77936~77939, 77941~77946, 77948, 77949, 1 male, 9 females, and 2 specimens of unknown sex, 141~231 mm SL, 44°20.6'N, 144°56.5'E, depth unknown, 12 Oct. 1978; HUMZ 78647, female, 248 mm SL,

44°11.6'E, 145°03'E, 400~450 m, 14 Sep. 1978; HUMZ 78754~78757, 2 males and 2 females, 237~262 mm SL, 44°31'N, 144°20'E, 650~950 m, 12 Nov. 1978; HUMZ 92713, female, 266 mm SL, 44°51'N, 144°25'E, 380~400 m, 8 Oct. 1981; NSMT-P 21484, male, 283 mm SL, 44°36.0'N, 144°20.5'E, depth unknown, 23 Sep. 1978; NSMT-P 21485, female, 257 mm SL, 44°31'N, 144°20'E, 650~950 m, 12 Nov. 1978. Collection localities are shown in Fig. 4.

Diagnosis. A *Careproctus* with simple, recurved canine teeth in bands; gill opening widely separated from pectoral fin; uppermost pectoral fin ray below posterior corner of maxillary; pectoral fin rays 26~31; pyloric caeca 33~50; peritoneum pale; stomach black.

Description of type specimens. Data for the holotype are followed by those for the paratypes.

Counts: Dorsal fin rays 57 (54~57), anal fin rays 51 (47~51), pectoral fin rays 27 (26~31), caudal fin rays 9 (8~10), vertebrae 11+51=62 (11~12+48~52=59~63), pyloric caeca 44 (33~50), cephalic pores 2-6-7-2.

Proportional measurements: Body depth 32.0 (26.8~34.8)% SL, head length 28.7 (25.7~29.9), head width 21.4 (17.5~22.9); snout length 33.5 (27.2~36.7)% HL, eye diameter 15.1 (13.9~18.3), interorbital width 39.1 (38.3~44.8), upper jaw length 47.2 (45.3~51.9), lower jaw length 43.6 (38.8~52.1), upper pectoral fin

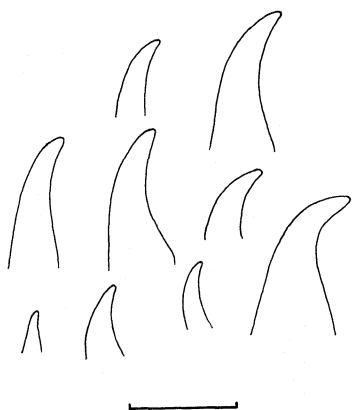


Fig. 3. Lateral view of premaxillary teeth of *Careproctus cyclocephalus* sp. nov., (paratype, HUMZ 78756). Scale indicates 1.0 mm.

lobe length 93.9 (80.9~111.6), lower pectoral fin lobe length 119.3 (84.5~126.6), gill opening length 33.6 (29.9~42.5), snout to disk length 49.9 (35.5~51.2), snout to anus length 75.8 (59.2~79.8), mandible to disk length 35.7 (29.1~41.8), mandible to anus length 60.6 (53.9~71.1), disk to anus length 8.9 (7.8~16.2), disk length 15.1 (13.4~18.0).

Body deep anteriorly, deepest at dorsal fin origin, then tapering rapidly to caudal fin. Skin tough, smooth, lacking prickles. Gelatinous tissue thick on anterior part of body including fins. Lateral line and other rudimentary pores absent.

Head large, massive, and globular. Profile of head descending steeply to snout. Nostril with a prominent tube on a horizontal through pupil. Eye moderately large. Mouth large, horizontal; maxillary extending posteriorly to below posterior margin of eye. Teeth small, simple, recurved canines with broad bases (Fig. 3). Tooth bands broad, composed of 15 (12~18) oblique rows on premaxillary and 14 (14~19) rows on dentary. Outer teeth much smaller, increasing rapidly in size towards inside of mouth. Symphyseal gaps between tooth bands narrow on both jaws. Cephalic pores small. Anteriormost pair of mandibular pores widely separated from each other. Gill opening wholly above pectoral fin; its lower end on a level with posterior corner of maxillary, separated from uppermost pectoral fin ray by a distance about equal to eye diameter. Opercular flap supported

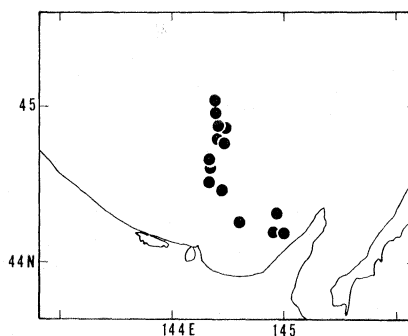


Fig. 4. Map showing collection localities of *Careproctus cyclocephalus* sp. nov.

by two spines: upper opercular spine stronger than lower spine; its tip on a horizontal with lower margin of eye.

Pectoral fin distinctly notched. Uppermost pectoral fin ray below a horizontal through posterior corner of maxillary. Upper pectoral fin lobe with 12 (11~16) rays reaching behind anal fin origin. Notch with 8 (6~8) rays. Lower pectoral fin lobe with 7 (6~9) long, exerted rays reaching behind anal fin origin (almost reaching anal fin origin or behind it). Rays of upper pectoral fin lobe and notch except for uppermost three rays evenly shortened ventrally to lower pectoral fin lobe. Symphysis of lower pectoral fin lobe below anterior margin of eye; symphyseal gap between them narrow. Tips of all pectoral fin rays except for uppermost ray free. Dorsal fin origin above gill opening. Anal fin origin below 10th (6th~10th) dorsal fin ray. Anterior dorsal and anal fin rays buried in thick gelatinous layer. Caudal fin narrow, continuous with dorsal and anal fins for about half its length; notches absent at union with vertical fins.

Disk small, flat, round with wide and thin margin; its length about equal to horizontal eye diameter (about equal to or somewhat smaller than eye diameter). Posterior margin of disk below posterior margin of orbit. Anus below a point about halfway between posterior margin of orbit and lower end of gill opening, separated from posterior margin of disk by a distance equal to two-thirds of disk length.

Stomach large. Pyloric caeca long, slender, located on left side of body cavity.

Body color when fresh reddish; posterior dorsal and anal fins and caudal fin black; eye

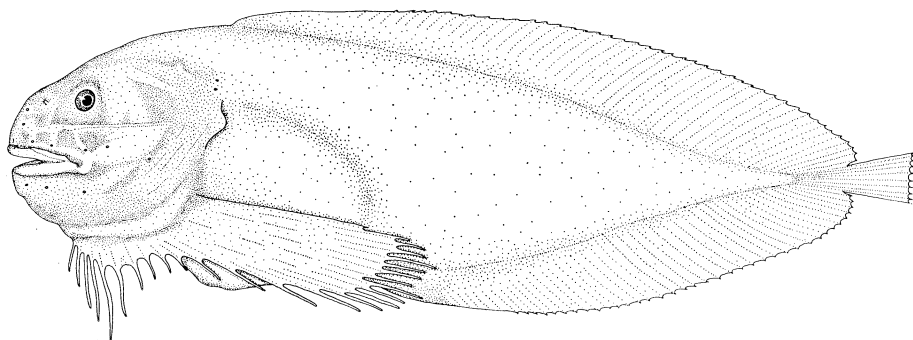


Fig. 5. *Careproctus macrodiscus* Schmidt, HUMZ 77643, 416 mm SL, from off Abashiri, Okhotsk coast of Hokkaido.

black. In alcohol reddish color faded; eye black; oral and gill cavities faintly dusky; peritoneum and pyloric caeca pale; stomach black.

Distribution. Off Abashiri (southern Okhotsk Sea) (Fig. 4) at depths of 380 to 950 m.

Remarks. In having distinctly recurved canines, gill opening widely separated from the pectoral fin, and uppermost pectoral fin ray set below the posterior corner of the maxillary, this species resembles *C. macrodiscus* Schmidt, but it is readily distinguishable from the latter by its smaller disk (13.4~18.0% of head length against 41.1~56.2%). In addition to the characters described above, it differs from other species of the genus in its deep body, pale peritoneum, black stomach, and relatively large number of pyloric caeca.

Careproctus macrodiscus Schmidt

(New Japanese name:

Ohôtsuku-konnyaku-uo)

(Fig. 5)

Careproctus macrodiscus Taranetz, 1937: 137 (nomen nudum); Schmidt, 1950: 208, fig. 18, pl. 19 (original description).

Material. 34 specimens: HUMZ 46461~46463, 46465, 46467, 46469, 67539~67541, 77588, 77614, 77643, 77645, 77688, 77691, 77753, 78759~78761, 78887, 92711, 92712, 7 males, 13 females, and 2 specimens of unknown sex, 204~416 mm SL, 44°25'N~44°53'N, 144°17.5'E~144°28'E, off Abashiri, southern Okhotsk Sea, depth 152~400 m, 3 Jul. 1975~8 Oct. 1981; HUMZ 54848, 55292, 55293, 55296, 55298, 4 males and 1 female, 289~443 mm SL, 57°59'N~58°21'N, 152°00'E, off Koni Peninsula, 130~215 m, 9 Jun. 1976; HUMZ

55495, 55504, 55506, 1 male, 1 female, and 1 specimen of unknown sex, 178~291 mm SL, 55°02'N, 154°18'E, eastern Okhotsk Sea, 445~465 m, 1 Jun. 1976; HUMZ 57845, 57846, 2 females, 355~381 mm SL, 56°44'N, 143°30'E, near Iona I., northwestern Okhotsk Sea, 305 m, 16 Sep. 1976; HUMZ 60358, male, 439 mm SL, 58°12'N, 154°10'E, off Pyagina Peninsula, northern Okhotsk Sea, 275 m, 13 Sep. 1976; HUMZ 60415, female, 328 mm SL, 56°37'N, 143°35'E, western Okhotsk Sea, 240 m, 22 Sep. 1976. Collection localities are shown in Fig. 10.

Diagnosis. A *Careproctus* with large disk, its diameter 1.8~2.4 in head length; gill opening wholly above pectoral fin, separated from uppermost pectoral fin ray by a noticeable distance; cephalic pore formula 2-5-6-2, supraocular and postocular pores absent.

Description. Counts: Dorsal fin rays 50~55, anal fin rays 44~48, pectoral fin rays 23~28, caudal fin rays 8~10, vertebrae 11+46~50=57~61, pyloric caeca 43~60, cephalic pores 2-5-6-2.

Proportional measurements: Body depth 28.3~37.0% SL, head length 26.2~33.2, head width 16.6~22.0; snout length 26.6~40.6% HL, eye diameter 9.2~14.7, interorbital width 39.6~44.4, upper jaw length 43.7~52.5, lower jaw length 40.7~50.7, upper pectoral fin lobe length 93.4~136.7, lower pectoral fin lobe length 41.0~73.0, gill opening length 19.3~37.1, snout to disk length 30.0~52.4, snout to anus length 81.6~115.9, mandible to disk length 29.3~45.1, mandible to anus length 84.4~113.8, disk to anus length 7.3~22.4, disk length 41.1~56.2.

Body massive, deep, tapering rapidly to caudal fin. Skin smooth, lacking prickles. Rudimen-

tary pores absent.

Head large, massive, its upper profile descending slowly to snout. Nostril tubular, short, on a horizontal through pupil. Eye small. Mouth large, horizontal; maxillary extending to below posterior margin of eye. Teeth small, recurved canines in 11~22 oblique rows forming broad bands on both jaws. Outer teeth much smaller than inner teeth. Symphyseal gaps between tooth bands narrow on both jaws. Cephalic pores small; supraocular and postocular pores absent. Anteriormost pair of mandibular pores widely separated from each other. Gill opening wholly above pectoral fin; its lower end separated from uppermost pectoral fin ray by twice horizontal eye diameter. Opercular flap supported by two spines: upper opercular spine as broad as lower spine; its tip on a level with lower rim of orbit.

Pectoral fin notch moderately deep. Uppermost pectoral fin ray below a horizontal through posterior corner of maxillary. Upper pectoral fin lobe with 13~17 long rays extending behind anal fin origin. Notch bridged by 4~5 widely spaced short rays. Lower pectoral fin lobe with 5~7 short rays reaching posterior margin of disk or anus. Tips of all pectoral fin rays except for uppermost ray free. Pectoral symphysis located below anterior portion of orbit; symphyseal gap between lower pectoral fin lobes narrow. Dorsal fin origin above gill opening. Anal fin origin below 7th~13th dorsal fin ray. Anterior rays of dorsal and anal fins buried in gelatinous layer; tips of remaining rays free. Dorsal and anal fin rays relatively long. Caudal fin broad, continuous with dorsal and anal fins for about half its length. Ends of dorsal and anal fins forming notches on caudal fin.

Disk large, flat, round with wide and thin margin. Disk located between verticals through anterior margin of eye and lower end of gill opening. Anus located below posterior tip of opercular flap, separated from posterior margin of disk by a distance about equal to horizontal eye diameter. In males, a small genital papilla just behind anus.

Stomach very large. Pyloric caeca long, slender, pointed, and located on left side of body cavity.

Body color when fresh entirely pinkish; eye except for pupil silver. In alcohol pinkish or

pale; eye black; oral and gill cavities, peritoneum, stomach, and pyloric caeca pale.

Distribution. The northern and southern Okhotsk Sea at depths of 130 to 465 m.

Remarks. This species is readily distinguishable from any other species of the genus by its disk, which is the largest of any *Careproctus* species. Schmidt (1950) in the original description of this species recognized the resemblance of this species to *C. ovigerum* from great depths off British Columbia in the general appearance of the body, tooth shape, and the development of the disk. However, according to the redescription of *C. ovigerum* by Stein (1978), this species is clearly different from it in all counts, the longer upper pectoral fin lobe (55.6~62.5% of head length in *C. ovigerum*), gill opening completely confined above the pectoral fin (gill opening extending ventrally in front of about 4 pectoral fin rays), and fewer head pores (2 nasal, 6 maxillary, 7 mandibular, and 1 suprabranchial pore).

Careproctus macrodiscus was described based only on the holotype (374 mm SL) which lost posterior anal fin rays and had the right gill opening mutilated. The present specimens provide the second record of this species and the first record from Japan.

Careproctus furcellus Gilbert et Burke

(New Japanese name:

Oguro-konnyaku-uo)

(Fig. 6)

Careproctus furcellus Gilbert and Burke, 1912a: 80, fig. 25 (original description); Burke, 1930: 126, fig. 40; Schmidt, 1950: 205, fig. 17.

Material. 31 specimens: HUMZ 34026, 34027, 2 males, 425~449 mm SL, off Kushiro, Pacific coast of Hokkaido, depth 450 m, 16 Jul. 1974; HUMZ 34172, 41730, 1 male and 1 specimen of unknown sex, 443~448 mm SL, east of Matsuwa I., Kuril Is., 320 m, 9 Jul. 1976; HUMZ 44877, 44879, 2 females, 331~347 mm SL, 50°15'N, 156°40'E, east of Paramushir I., Kuril Is., 205~235 m, 13 May 1975; HUMZ 44881, 46211, 46212, 1 male and 2 females, 291~461 mm SL, 55°51'N, 162°17'E, Gulf of Kamchatkii, eastern coast of Kamchatka, 287~300 m, 16 May 1975; HUMZ 44890, 46254, 46255, 55489, 3 males and 1 specimen of unknown sex, 187~439 mm SL, 55°02'N~55°24'N,

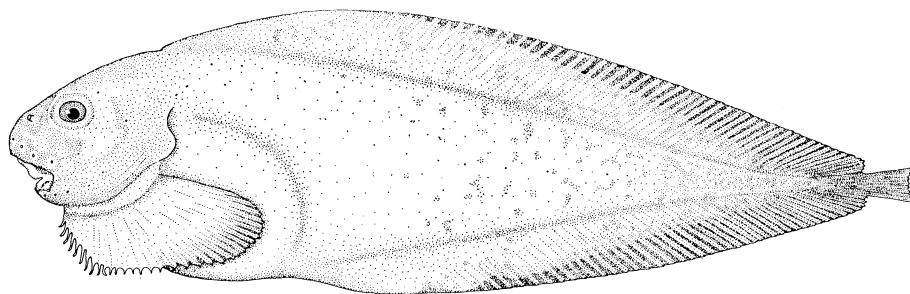


Fig. 6. *Careproctus furcellus* Gilbert et Burke, HUMZ 92716, 394 mm SL, from off Abashiri, Okhotsk coast of Hokkaido.

154°18'E~154°50'E, eastern Okhotsk Sea, 98~465 m, 9 May 1975~1 Jun. 1976; HUMZ 46472, male, 358 mm SL, 51°55'N, 154°55'E, eastern Okhotsk Sea, 300~305 m, 11 May 1975; HUMZ 46480, 46482, 55199, 55425, 55427, 55989, 55996, 1 male and 6 females, 275~389 mm SL, 53°36'N~54°16'N, 160°23'E~160°57'E, Gulf of Kronotskii, eastern coast of Kamchatka, 125~520 m, 15 May 1975~20 May 1976; HUMZ 46495, female, 363 mm SL, 57°01'N, 163°13'E, Gulf of Ozernoi, eastern coast of Kamchatka, 150~170 m, 17 May 1975; HUMZ 46510, female, 391 mm SL, 54°05'N, 154°40'E, eastern Okhotsk Sea, 163~172 m, 8 May 1975; HUMZ 67533, 67537, 77615, 78645, 92716, 2 males, 2 females, and 1 specimen of unknown sex, 221~394 mm SL, 44°11.6'N~44°53'N, 144°19'E~145°03'E, off Abashiri, southern Okhotsk Sea, 152~790 m, 2 Jul. 1977~8 Oct. 1981; HUMZ 68121, male, 306 mm SL, 51°44'N, 175°33'W, southeast of Atka I., Aleutian Is., 320~340 m, 8 Jul. 1977; HUMZ 81826, female, 291 mm SL, 54°20.09'N, 167°20.90'W, north of Unalaska I., Bering Sea, 805 m, 22 Jun. 1979; HUMZ 81897, female, 110 mm SL, 57°50.92'N, 173°57.72'W, Bering Sea, 725~750 m, 21 Jun. 1979. Collection localities are shown in Fig. 10.

Comparative material: *Careproctus cypselurus* (Jordan et Gilbert): HUMZ 79749, male, 273 mm SL, 44°30'N, 144°26'E, off Abashiri, southern Okhotsk Sea, 1080~1310 m, 2 Nov. 1978; HUMZ 81920, female, 148 mm SL, 58°33.28'N, 175°05.39'W, Bering Sea, 895~910 m, 22 Jun. 1979.

Diagnosis. A *Careproctus* with notchless pectoral fin; disk triangular; snout projecting; pectoral fin rays 32~37; pyloric caeca 33~49.

Description. Counts: Dorsal fin rays 61~65, anal fin rays 54~59, pectoral fin rays 32~37, caudal fin rays 10, vertebrae 10~11+57~61=67~71, pyloric caeca 33~49, cephalic pores 2~6~7-2.

Proportional measurements: Body depth 20.5~30.1% SL, head length 17.1~27.0, head width 10.3~15.9; snout length 33.4~44.6% HL, eye diameter 13.7~25.0, interorbital width 45.5~51.9, upper jaw length 37.2~46.8, lower jaw length 34.1~42.5, pectoral fin length 67.9~86.0, gill opening length 23.0~39.9, snout to disk length 37.2~52.4, snout to anus length 52.5~73.8, mandible to disk length 22.3~38.0, mandible to anus length 36.9~56.6, disk to anus length 1.7~7.1, disk length 11.7~19.6.

Body stout, relatively deep, tapering rapidly to a point slightly less than head length anterior to hypural plate, then slowly to caudal fin. Skin tough, smooth, lacking prickles. Rudimentary pores present, forming three rows on each side of body: upper row extending from nape to base of second or third dorsal fin ray; middle row only above anterior curve of lateral line; lower row forming lateral line from behind suprabranchial pores to caudal fin.

Head stout, almost rectangular in dorsal view, dorsal profile evenly descending to upper jaw. Nostril with a moderately long tube on a horizontal with lower margin of eye. Eye moderately large. Snout deep, projecting over mouth. Mouth inferior, broad; maxillary extending to below pupil. Teeth small, slender, arranged in about 18~37 oblique rows in moderately wide bands on both jaws. Large inner teeth faintly lobed or simple. Outer teeth simple, smaller than inner teeth. Symphysial gaps between tooth bands narrow on

both jaws. Cephalic pores small; anterior pores larger than posterior pores. Pores at mandibular symphysis widely separated from each other. Gill opening entirely above pectoral fin; its lower end separated from uppermost pectoral fin ray by a distance about equal to diameter of pupil. Opercular flap supported by two spines sharply angled ventrally: upper opercular spine stronger than lower spine; its tip slightly below a level of lower margin of orbit.

Pectoral fin unnotched, not divided into lobes. Uppermost pectoral fin ray below a level of posterior corner of maxillary. Longest ray of pectoral fin almost reaching anal fin origin. Anteriormost 7~10 rays evenly increasing in length dorsally, thickened and exerted. Pectoral symphysis below anterior portion of eye; symphyseal gap between lower pectoral lobes narrow. Dorsal fin origin above tip of opercular flap. Anal fin origin below 6th~9th dorsal fin ray. Caudal fin slightly emarginate, continuous with vertical fins for about half its length. Posterior margins of dorsal and anal fins forming notches on caudal fin.

Disk below eye, triangular; its width equal to or wider than its length. Margin thin, edges curled towards center. Anus immediately behind disk. In mature males, a short and conical genital papilla just behind anus.

Stomach large. Pyloric caeca long, slender, located on left side of body cavity.

Body color when fresh pinkish; eye black; posterior part of body, dorsal, anal and pectoral fins black. In alcohol body pinkish or pale, dusted with black; eye and fins black; oral and gill cavities dusky; peritoneum black; stomach and pyloric caeca pale.

Distribution. The Bering Sea, off the Aleutian Islands, eastern coast of Kamchatka, off the Pacific side of the Kuril Islands, the Okhotsk Sea, and the Pacific coast of Hokkaido at depths of 98 to 882 m.

Remarks. This species is very similar to *C. cypselurus* in having a heavy head, notchless pectoral fin, gill opening completely above pectoral fin, opercular spines sharply angled ventrally, and a triangular disk (Gilbert and Burke, 1912a; Burke, 1930). Meristic characters also overlap. However, they differ by the combination of the following characters: pectoral fin notch absent in *C. furcellus* (slightly notched

in *C. cypselurus*); snout projecting (not projecting); caudal fin emarginate, nearly truncate when spread (distinctly forked); body color when fresh pinkish (purplish indigo).

Careproctus furcellus has been recorded from the Bering Sea between Petral Bank and Agattu Island by Gilbert and Burke (1912a) and the Okhotsk Sea (northeast of Cape Terpenie and the northern Okhotsk Sea) by Schmidt (1950). The new specimens show that *C. furcellus* is widely distributed in the Okhotsk and Bering seas and their adjacent waters.

Paraliparis grandis Schmidt

(New Japanese name: Hira-inki-uo)

(Fig. 7)

Paraliparis grandis Taranetz, 1937: 138 (nomen nudum); Schmidt, 1950: 218, fig. 21, pl. 20 (original description).

Material. 28 specimens: HUMZ 55196, 55198, 55200, 55201, 2 males and 2 females, 310~355 mm SL, 53°43'N, 160°33'E, Gulf of Kronotskii, eastern coast of Kamchatka, depth 515~520 m, 20 May 1976; HUMZ 70924, 71131, 77585, 77593, 77642, 77657, 77658, 77679, 77812, 77813, 77953, 77955, 77957~77960, 78747, 78788, 78855~78858, 78860, 80126, 140~381 mm SL, 16 males, 7 females, and 1 specimen of unknown sex, 44°11'N~45°09'N, 144°20.5'E~145°03.5'E, off Abashiri, southern Okhotsk Sea, 400~1000 m, 23 Oct. 1977~11 Oct. 1978. Collection localities are shown in Fig. 10.

Diagnosis. A *Paraliparis* with heavy teeth with rounded tips in 8~12 rows on both jaws; dorsal fin rays 71~82, anal fin rays 64~76, pectoral fin rays 31~39.

Description. Counts: Dorsal fin rays 71~82, anal fin rays 64~76, pectoral fin rays 32~39, caudal fin rays 7~8, vertebrae 10~11+65~74=75~86, pyloric caeca 24~41, cephalic pores 2-6-7-1.

Proportional measurements: Body depth 17.0~26.3% SL, head length 14.5~19.3, head width 8.6~12.2; snout length 26.4~34.4% HL, eye diameter 16.2~23.9, interorbital width 34.7~42.4, upper jaw length 36.5~43.1, lower jaw length 34.4~42.0, upper pectoral fin lobe length 69.4~88.9, lower pectoral fin lobe length 57.2~101.1, gill opening length 25.8~37.1, snout to anus length 38.1~66.4, mandible to

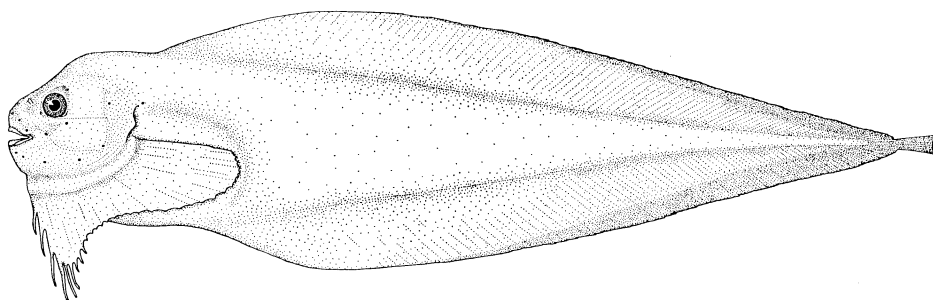


Fig. 7. *Paraliparis grandis* Schmidt, HUMZ 77658, 343 mm SL, from off Abashiri, Okhotsk coast of Hokkaido.

anus length 37.9~59.0.

Body long, greatly compressed, deepest at occiput, then tapering slowly to caudal fin. Skin thin, fragile, smooth, lacking prickles. Rudimentary pores absent.

Head small, its upper profile descending steeply to snout. Nostril with a short tube just anterior to eye on a level with mid-pupil. Eye moderately large. Mouth small, horizontal; maxillary extending posteriorly to below middle of eye. Teeth short, stout, rounded at tips (Fig. 8), forming moderately wide bands of 8~12 oblique rows on both jaws. Outer teeth slightly smaller than inner teeth. Symphyseal gaps between tooth bands narrow on both jaws. Cephalic pores small. Anteriormost pair of mandibular pores closely spaced, located in the same pit. Gill opening small, extending ventrally in front of 1~4 pectoral fin rays. Opercular flap supported by two spines angled ventrally: upper opercular spine short, much broader than lower spine; its tip straight on a level with lower margin of orbit.

Pectoral fin notch moderately deep. Uppermost pectoral fin ray on a level with posterior corner of maxillary. Upper pectoral fin lobe almost reaching anal fin origin. Rays of notch about 10, not easily distinguishable from those of upper pectoral fin lobe. Lower pectoral fin lobe with 4~6 rays extending to below gill opening or behind it when depressed. Symphysis of lower pectoral fin lobes below anterior margin of orbit, but in larger specimens more than about 300 mm SL position of symphysis shifted forward to below nostrils with development of gonad; anteriormost pectoral rays of both sides connected by a fold of skin. Dorsal fin origin slightly behind a vertical through gill

opening. Anal fin origin below 7th~10th dorsal fin ray. Caudal fin narrow, continuous with dorsal and anal fins for about two-fifths of its length without notches at union.

Stomach and pyloric caeca located on left side of body cavity. Stomach small. Pyloric caeca long and slender.

Body color when fresh dusky pink; eye and fins black. In alcohol body pinkish or pale with melanophores densely scattered over body; eye and fins black; oral cavity dusky; gill cavity and peritoneum black; stomach and pyloric caeca pale.

Distribution. The northern Okhotsk Sea (Schmidt, 1950), the southern Okhotsk Sea and off the eastern coast of Kamchatka at depths of 400 to 1000 m.

Remarks. Schmidt (1950) reported that the holotype of *P. grandis* had 70 dorsal, 69 anal, 31 pectoral, and 10 caudal fin rays. But a radiograph of the holotype (Zool. Inst., No. 24486), which Prof. A. P. Andriashev kindly sent me,

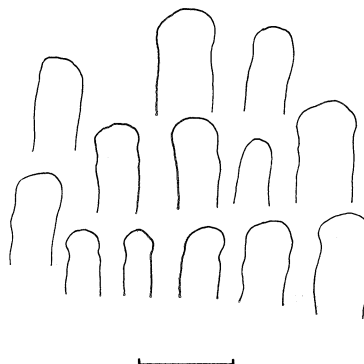


Fig. 8. Premaxillary teeth of *Paraliparis grandis*, HUMZ 77812. Scale indicates 0.5 mm.

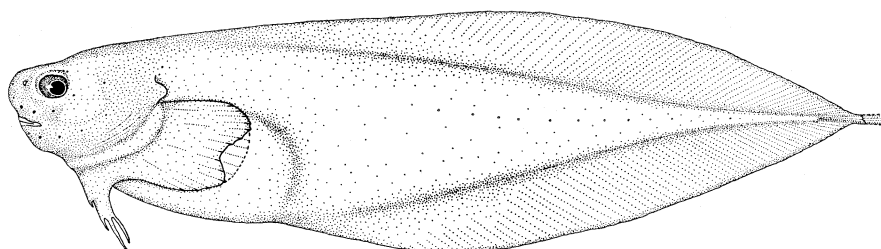


Fig. 9. *Paraliparis rosaceus* Gilbert, HUMZ 77743 (partially skinned), 309 mm SL, from off Abashiri, Okhotsk coast of Hokkaido.

shows that it has 75 dorsal, 68 anal, and 7 caudal fin rays and 78 vertebrae. These counts of the new specimens agree with those of the holotype. The number of pectoral fin rays in the holotype is 31 (Prof. A. P. Andriashev, personal communication) and differs from that of our specimens by one. I believe that the difference between the holotype and the new specimens is due to intraspecific variation in *P. grandis*.

The counts of dorsal and anal fin rays of this species are the highest of all known *Paraliparis* species (Schmidt, 1950), and vary widely. In many liparidid fishes, variation within species in number of dorsal and anal fin rays has been considered to be not more than seven (Burke, 1930; Stein, 1978), but in a few species variation is more than ten rays, as shown in this species in addition to *Lipariscus nanus* and *Nectoliparis pelagicus* (see Peden, 1981).

Teeth of this species are peculiar in having round tips, similar to those in *P. atramentatus*. However, the latter has distinctly fewer fin rays (52 dorsal, 44 anal, and 20 pectoral fin rays (Gilbert and Burke, 1912b)).

Paraliparis grandis has been known only from the holotype (234 mm SL). The specimens described here provide the second record of this species.

***Paraliparis rosaceus* Gilbert**
(New Japanese name: Ao-inki-uo)
(Fig. 9)

Paraliparis rosaceus Gilbert, 1890: 93 (original description); Garman, 1892: 80; Burke, 1930: 182, fig. 100; Stein, 1978: 41, fig. 11(c); Peden and Ostermann, 1980: 215, fig. 3.

Paraliparis grandiceps Garman, 1899: 117, pl. 29 (original description); Burke, 1930: 183, fig. 101.

Material. HUMZ 77743, 77802, 77816, 3 males, 287~309 mm SL, 44°25'N~44°56'N, 144°24'E~145°04'E, off Abashiri, southern Okhotsk Sea, depth 1050~1350 m, 8 Sep. 1978~11 Oct. 1978. Collection locality is shown in Fig. 10.

Diagnosis. A *Paraliparis* with small canine teeth in a single series and in bands only at symphysis on both jaws; head length 18.2~19.7% of standard length; pectoral fin rays 18~22.

Description. Counts: Dorsal fin rays 63~69, anal fin rays 57~60, pectoral fin rays 20~22, caudal fin rays 6, vertebrae 12~13+58~61=70~74, pyloric caeca 6~8, cephalic pores 2~6~7~1.

Proportional measurements: Body depth 21.4~23.5% SL, head length 18.2~19.7, head width 13.4~13.6; snout length 28.7~36.7% HL, eye diameter 17.0~20.9, interorbital width 40.5, upper jaw length 39.9~42.6, lower jaw length 38.2~40.5, upper pectoral fin lobe length 54.0~65.7, lower pectoral fin lobe length 58.8~76.2, gill opening length 15.2~16.9, snout to anus length 73.0~81.4, mandible to anus length 62.6~71.1.

Body stout, tapering slowly to caudal fin. Skin thin, fragile, lacking prickles. Gelatinous tissue thick except for caudal fin. Rudimentary pores forming lateral line to caudal fin.

Head small, low, almost flat in interorbital region; its upper profile descending very slowly to snout, then abruptly to upper jaw. Nostril represented by raised rim on a level with pupil. Eye moderately large. Mouth slightly inferior, wide, horizontal; maxillary extending posteriorly to below middle of eye. Teeth short, small, relatively blunt, forming narrow bands composed of 2~5 oblique rows at symphysis, com-

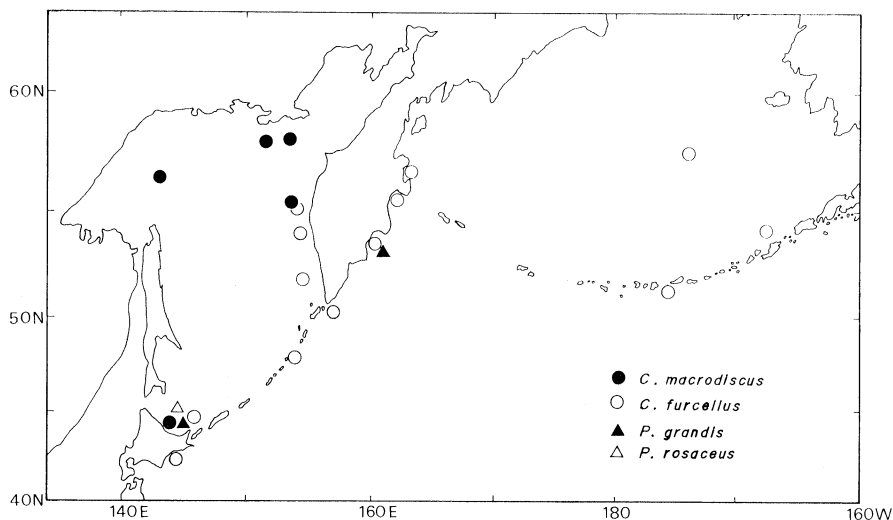


Fig. 10. Map showing collection localities of four liparidid fishes.

pletely uniserial on posterior part of premaxillary and dentary. Cutting surface of premaxillary and dentary very narrow. Symphyseal gap between tooth bands wide on upper jaw, narrow on lower jaw. Anterior cephalic pores larger than posterior pores. Pores at mandibular symphysis close to each other, but not in a common pit. Gill opening small, wholly above pectoral fin. Opercular flap supported by two spines recurved dorsally: upper opercular spine stronger than lower spine; its tip on a horizontal through pupil.

Pectoral fin deeply notched. Uppermost pectoral fin ray on a horizontal through lower margin of orbit. Upper pectoral fin lobe with 13~15 rays, round, short, not reaching anal fin origin. Notch bridged by 4 widely spaced rays. Lower pectoral fin lobe with 3 rays somewhat longer than upper pectoral fin lobe; its rays abruptly increasing in length dorsally. Lower pectoral fin lobes widely separated from each other. Dorsal fin origin posterior to a vertical through opercular flap. Anal fin origin below 9th~11th dorsal fin ray. Anterior dorsal and anal fin rays buried deeply in gelatinous tissue. Caudal fin narrow, continuous with dorsal and anal fins for about two-thirds of its length without notches at union.

Anus located between both lower pectoral fin lobes with a small genital papilla in males.

Stomach very large. Pyloric caeca long,

slender, located on left side of body cavity.

Body color when fresh bluish with faint pink; eye black; head, pectoral fin, and posterior part of vertical fins black. In alcohol pinkish color faded; eye black; oral cavity dusky; branchial cavity and peritoneum black; stomach and pyloric caeca pale.

Distribution. The Pacific coast of California and Oregon (Gilbert, 1890; Stein, 1978), British Columbia (Peden and Ostermann, 1980), and the Okhotsk coast of Hokkaido at depths of 1050 to 3358 m.

Remarks. The specimen HUMZ 78816 differs from Stein's description in having higher counts of dorsal and anal fin rays and vertebrae (69, 60 and 74). These differences are apparently variation within species, because other characters of this specimen fit his description very well. These counts extend their known ranges (dorsal fin rays 57~69, anal fin rays 54~60, vertebrae 67~74).

Paraliparis rosaceus has been recorded only from the Pacific coast of North America at depths of 1799 to 3358 m (Gilbert, 1890; Stein, 1978; Peden and Ostermann, 1980). The present specimens taken from off Abashiri are the most western record of this species, and its shallowest record (1050~1350 m).

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オホーツク海、ベーリング海およびその近接海域から得られたクサウオ科の1新種と4稀種

木戸 芳

オホーツク海、ベーリング海などから得られたクサウオ科のコンニャクウオ属 *Careproctus* とインキウオ属 *Paraliparis* の5種を記載した。新種のダルマコンニャクウオ *Careproctus cyclocephalus* を、網走沖のオホーツク海から得られた32個体に基づき記載した。本種は、歯が犬歯状で後方へそりかえっていること、鰓孔が胸鰭まで達しないこと、胸鰭の最上鰭条が主上顎骨後端より下方に位置すること、胸鰭条数が26~31本であること、腹膜が淡色であること、また胃が黒いことなどで、他種と区別される。オホーツクコンニャクウオ (新称) *C. macrodiscus* とヒラインキウオ (新称) *P. grandis* は、従来オホーツク海北部から採集されたそれぞれ1個体のみが知られていたが、網走沖などから得られた多数の標本に基づき、第二番目の記録として再記載した。オグロコンニャクウオ (新称) *C. furcellus* はアリューシャン列島沖およびオホーツク海の中・北部から知られていたが、ベーリング海、オホーツク海および北海道の太平洋岸沖合などに広く分布することが明らかになった。また、アオイインキウオ (新称) *P. rosaceus* は北太平洋東部の深海からのみ知られていたが、北海道のオホーツク海沖にも分布することが明らかとなった。これらの5種は、すべて日本初記録である。

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